3.0 EQUIPMENT ACQUISITION AND FIELD TEST PREPARATION

3.1 General Information

An important task (Task 2) of this project is to establish an on-board sound intensity system that meets the current and future OBSI measurement needs of the NCDOT. Therefore, to collect necessary information on the OBSI system, including auxiliary equipment and non-standard microphone mounting fixture at the outset of the research, the Principal Investigator (PI, George Wang) visited the California Department of Transportation in Sacramento, CA (Caltrans, Mr. Bruce Rymer) and Illingworth & Rodkin, Inc. in Petaluma, CA (Dr. Paul Donavan) for a consultation of OBSI related issues. The PI also consulted B&K's offices in the US, Canada, and Denmark for technical queries. Following these initial meetings and interactions, the team prepared a list of detailed instrumentation, including parts, fixture, calibration equipment, tools, hardware and software selected for this project. Furthermore, the PI communicated with the Washington Department of Transportation (Mr. Tim Sexton) and Texas Department of Transportation (Mr. John Wirth) about the OBSI apparatus used in the Washington DOT and the Texas DOT respectively. The detailed equipment list was verified again with manufacturers, suppliers, and agencies.

Based on the list of instrumentation, before purchasing, selected suppliers were solicited and their quotations and specifications of the equipment parts were evaluated by the PI. The products were verified to ensure that they were compatible or consistent with the AASHTO standard requirements, and also compatible to those used by other states for tire-pavement noise measurement. The sales engineer from B&K (Mr. Will Kinard), the supplier of the PULSE® analyzer, met with the team on two different occasions for detailed demonstrations of the products.

3.2 OBSI Microphone Mounting Fixture and Fabrication

The microphone mounting fixture is a critical aspect of the system which directly affects the stability of the entire measuring hardware mounted outside of the test vehicle, adjacent to the test tire. The fabricating of the microphone mounting fixture was accomplished through a special machine shop at ECU, based on the shop drawings provided by Dr. Paul Donavan of Illingworth & Rodkin, Inc. The non-standard parts of the mounting fixture are summarized in Table 3.1. The standard parts are summarized in Table 3.2.